**DECEMBER, 1910.**

# ENTOMOLOGICAL NEWS

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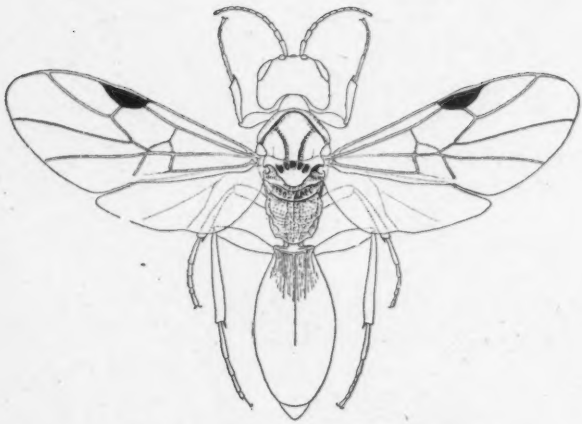

Vanhornia eucnemidarum Crawford.

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Offerata, rare species of North American Coleoptera. *Lack full set.

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A BROAD DITCH AT BOSKOOP, HOLLAND, COMPLETELY COVERED BY A CARPET OF AZOLLA—SMITH.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXI. DECEMBER, 1910. NO. 10.


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## Azolla vs. Mosquitoes.


BY JOHN B. SMITH, SC.D.


(Plate XIV)

During the summer of 1908 there appeared in the newspapers throughout the country an extract from a consular report, stating, in effect, that experiments made in Germany had demonstrated that a water plant, a specimen of *Azolla,* had been made practically useful in dealing with the mosquito pest by preventing their breeding.

Naturally this interested me and I tried to ascertain just what basis there was for the report. I could learn little about *Azolla* from such botanists as I consulted. Every one of them knew it, but not one of them knew very much about it: it was simply one of those locally common things that is taken for granted.

Meanwhile Dr. Bartmann, the exploiter of the *Azolla* proposition had written to the Governor of New Jersey, offering, for an adequate pecuniary reward to come to the relief of the State and to make experiments. The letter was referred to me in due course and I put myself into communication with

the good Doctor hoping to get further light on the subject. But the Doctor refused to shed any light whatever without a supply of the right kind of illuminant, and Dr. E. B. Voorhees who was at that time in Europe, failed to find him at his home in Wiesbaden. Meanwhile I had enlisted the aid of Dr. David Fairchild of the U. S. Department of Agriculture, and of Dr. N. L. Britton, Director of the Botanical Garden at Bronx Park, New York City, in getting a supply of the *Azolla* from Europe. Through the former I secured a sending from the Botanical Gardens at Hamburg, which arrived in bad condition; through the latter I received a supply from the Botanical Gardens at Kew, England, which arrived in excellent condition and which was propagated in the Bronx Park houses during the winter of 1909-10. It appeared also that a native species of *Azolla* did actually occur in New Jersey, but only in two places where it had been planted years ago and where it had just maintained itself, without spreading, for several years.

The matter was considered worth investigating first, because it seemed to have German official endorsement: second, because I remembered very clearly during my visit to the Dutch low countries in 1900 most of the ditches were covered by a complete coating of plants that parted readily for a boat but closed in again, immediately behind. This vegetation, I now learnt was a species of *Azolla* and it did not seem improbable to me that this covering of a vegetable carpet might really account for the very general freedom from mosquitoes, enjoyed in these regions. An attempt to secure a supply of the Dutch *Azolla* in a nursery importation in the late winter of 1909 also failed because the plants were dead when received; but from the sources already mentioned I found myself in the possession, at the Bronx Park, of a small supply of plants at the opening of the season of 1910. These plants were put out at several points in May and at first they did well, began to multiply, and apparently found something not to their liking. No one could explain the difficulties so but one thing remained

to be done: visit the home of the plant and find out all about it myself. In late August therefore I started and found myself at Hamburg during the early days of September. I found a very cordial reception at the Botanical Institution and Garden, at the Station fur Pflanzenschutz, and at the Institut für Schiffs-and Tropen-krankheiten, and soon had all the information it was theirs to give.

It was the Botanical Garden that had supplied the plants, and the Institute for Tropical diseases that had watched and, in a measure, checked the experiments made by Dr. Bartmann near Wilhelmshafen and elsewhere. The records and reports showed clearly enough that under favorable conditions the *Azolla* would form a surface covering on water areas that would absolutely prevent mosquito breeding and would not adversely affect fish and other aquatic animals. They showed also, however, and quite as conclusively that the *Azolla* required the most favorable conditions to accomplish this and that even a small percentage of salt and even a moderately low temperature was either fatal to the plant or checked its growth. One of the New Jersey failures was thus explained by the entrance of some brackish water into the pond and seemed to demonstrate that on salt marsh areas or wherever tides of brackish water ever entered, the plant would be useless. It was also found that a cold storm in August killed so large a percentage of the plants that it required 3 weeks to become re-established and, meanwhile *Anopheles* bred merrily and even maintained itself along the edges where grasses and rushes prevented the complete surface covering of the plants. Furthermore the plants would not stand the North German winters which are not as severe as our own. The practical conclusion was that in North Germany *Azolla* could not be relied upon to control mosquitoes to any practical extent and the experiments were abandoned. It was however indicated that in warmer countries better results might be obtained and experiments in the German Colonies in Africa are to be continued. Curiously enough none of the officials or

experimenters had made any attempt to discover under what conditions Azolla flourished naturally and, ecologically, the plant was no better known at Hamburg than it was in New Jersey.

My next headquarters were at Amsterdam and my first real acquaintance with *Azolla* was made at Boskoop, accompanied by Dr. Quanije of the Phytopathological Service, Mr. Moerlands of the Horticultural School and Mr. Ouwerkerk of the Nurserymen's Association. Here, undoubtedly *Azolla* formed a complete vegetable carpet over every ditch and canal, and mosquito breeding was practically impossible. So luxuriant was the plant that it could be twice removed from the surface during the season always leaving enough to restore the covering promptly.

During the next two weeks I covered the bulk of the "polder" area in Holland; and found just where and how *Azolla* flourishes.

First of all, it occurs nowhere, so far as I could learn, outside of the "polders" or reclaimed areas, where the water was all stagnant. Second, its point of greatest abundance coincides with the most completely developed peat or turf area. Haarlem, Leiden, Boskoop and vicinity have every ditch and almost every canal covered by an almost perfect carpet and these are the richest peat areas in the country. South of Rotterdam where there is a sand or clay addition, *Azolla* works out, and the same is true east of Amsterdam, not a trace of it being seen at Naarden.

Nor does the plant maintain itself in shallow water, where ice forms to the bottom. It comes in year after year only in ditches three feet deep which never freeze to the bottom, and where ground ice never forms. A severe winter is always followed by scanty crop of *Azolla* next summer.

In Belgium I did not see the plant at all; but I had neither the time nor the funds to continue my investigations in that country as I had done in Holland.

As the practical outcome of my work I feel no hesitation

in saying that *Azolla* is useless in dealing with the local city and the salt marsh problems. But there is a chance that in some of our South Jersey peat bottom swamps the plant may do good service and there I hope to be able to establish it. It is also quite possible that in some of the more southern states its range of usefulness may be greater. For New Jersey I do not see any great or immediate advantage from the plant; its habits are such, however, that in localities better adapted to it, great benefit may result from its introduction.

## Notes on the Life Stages of Catocalae; a Summer's Record and Incidental Mention of Other Lepidoptera.

By R. R. Rowley and L. Berry.

As has been the case for the past two or three years there was a warm spell in late March and early April and, as usual, a promise of an early summer but everybody knows how deceptive these promissory signs were. The middle of April found us in the grip of a second winter and venturesome insect life either perished or crawled back into its hole and awaited a second invitation to come forth. Butterflies had been on the wing and the early April warmth had nursed to life the eggs of various moths that make our springtime and early summer fauna.

The record shows a fine imago of *Papilio zolicaon* from a pupa sent to the senior author by Mr. E. A. Dodge of Santa Cruz, California, March 18th; an imago of *P. asterias,* ex pupa, March 20th; a *P. philenor* on the 29th of the same month and a fine male *luna* on the 30th.

The eggs of *Catocala ilia* began hatching on the 31st of March and finished up on the 1st of April. The buds of bur oak were just bursting and the young "crawlers," unlike the lively brood of April, 1909, settled down to their diet of foliage and seemed contented and happy. What a delight to watch the little fellows grow and the colder the weather out of doors,

the sturdier grew the caterpillars, in doors! The two weeks before the destructive sleet, snow and frost, had, however, given them strength to meet the cold that wilted the foliage of every tree and shrub.

It is hardly possible that the eggs of *ilia* in the woods did not hatch until the wintry winds had ceased to blow, about the 26th of April, but *illecta* larvae were past the second moult by the 5th of April out on the honey locust sprouts, and on the 20th were found the first *innubens* larva, half grown.

April 1st a chrysalid of *Smerinthus cerisyi* (*ophthalmicus*) from E. A. Dodge gave a fine male imago, later two other males, and unfortunately, a deformed female.

The first find of *illecta* larvae was on the 6th of April, 17 of them and one was half grown (past 3d moult). The last, nine in number, were found on the 30th. The first *illecta* caterpillar began spinning on the 15th of April.

The record for April 17th reads, "Ice last night. Cold west wind with gusts of driving snow. Found 26 larvae of *C. illecta*, chilled and half frozen, the snow beating me in the face as I searched for the little "Cato-worms."

The snow continued through the 18th and 19th and the young foliage of the forest was frozen stiff by the morning of the 23d. Still the *illecta* larvae lived out of doors. The morning of the 24th with two inches of snow settled the fate of the fruit and must have played havoc with larvae for I found exposed caterpillars of *illecta* and *innubens* frozen stiff and dead but I found others alive later on. It is surprising how much cold these tender, unprotected creatures can stand!

The young larvae of *Catocala ilia* have small black heads, are gray and with lateral round black spots. At ten days of age, the larva is over half an inch long, lighter gray with four large lateral black spots to each side. The little tubercles are black.

Remembering his experience with *ilia* larvae the year before, the senior author placed small bur oak twigs or branches in the breeding jars and the larvae appeared tame, as they

lay along the dark colored twigs or ate the bur oak catkins. It is a little strange that these branches would convert untamed, restless "crawlers" into docile, lazy "worms," but so it seemed for in 1909 the whole brood died of over exertion and failure to take proffered nourishment.

The eggs of *Catocala unijuga,* secured by the junior author, hatched on the 8th and 9th of April. These larvae did well from the beginning, feeding on willow and differed in no wise from the brood fed by the senior author in 1907 and described in a paper that year.

From the *ilia* larvae, seventeen reached maturity and spun pupal cases but only fourteen imagoes emerged, eleven males and three crippled females, all of uniform color, rather dark, and of the normal form. The female that laid the thirty eggs producing this brood, was a plain *ilia.* That there was no variation in these bred moths was a source of some disappointment but, after all, it strengthened the belief that when individuals of a variety are common they are the offspring of varietal parents.

The first moths, three in number, from the brood in doors, emerged on the 13th of June and the last one on the 17th, while the first seen in the woods was on the 16th of the same month. From this fact, it would seem that the *ilia* larvae in the woods passed through the freezing weather of the first two weeks of April.

Of the fourteen bred imagoes, three were so badly crippled as to be worthless, a lone female with a very small hind wing having been kept as an oddity.

About fifty per cent. of the eggs yielded chrysalids, thirty three and a third per cent. of the eggs gave fine cabinet specimens. On June 23d the senior author took in the woods a specimen each of *Catocala ilia* and *innubens,* the latter ragged.

A number of *ilia* were seen at that time.

On the next day in company with Harold Davenport, a young *Catocala* enthusiast, he took six *ilias* and one *polygama,* one of the former being *uxor* or the white spotted variety, while

on the 30th, of twenty captured *ilia,* two had pure white spots. Five *innubens* taken at this time were all of the variety *hinda.* It was nearly a month after this before the normal *innubens* appeared in any number. Furthermore, the *hinda* were all much smaller than the later normal *innubens.*

On July 3d in company with Geo. H. Hosenfelt and Walter Brown of St. Louis, sixteen *ilia,* several of them *uxor,* seven *hinda* and three worn *polygama* were taken. After this date other *ilia* were captured but in poor condition. In fact specimens were seen up to the 1st of September. Here at Louisiana, it has been the best *ilia* year since 1900. Two of the specimens taken on the 30th of June had pale hind wings, one of them being quite as yellow as *neogama.*

The first *illecta* larva began spinning April 15th, a whole month in advance of *parta* larvae which began hatching on the 16th and yet the first and only *parta* I ever saw taken here (the night of June 29th, 1906, at sugar and by Mr. E. A. Dodge) was in company at the bait with a somewhat weathered *illecta.* It might be proper to state here that on the same evening the first and only *Catocala consors* ever seen alive by the senior author was taken in the little clump of small trees where we were trapping. How it did rain that night and what a drenching we all got!

The eggs of *parta* and *scintillans* began hatching on April 16th. Larva of the former, one day old, is light brown with dark chestnut head. On the 24th the caterpillars were one third of an inch long, light (almost flesh color) with a very light dorsum. Head, light chestnut. This was after the first moult. Just before the moult the color is light rusty-brown. April 26th the larva reddish brown along the side and light middorsally. The red-brown along the sides is much darker above the prolegs. Head light brown or chestnut. Prolegs very dark at base, lighter outward. Head chestnut.

Eggs of *vidua* and *palaeogama* hatched on April 30th. When full grown, larvae of *ilia* hide beneath paper in the bottom of the jar in day time, feeding at night, exactly the re-

verse of *illecta* which never seems to try to conceal itself nor does it cease eating, day or night. *Innubens* at maturity makes some attempt to conceal itself but in captivity, feeds all the time. *Parta* and *unijuga*, like *ilia*, seem to feed only at night and more or less conceal themselves by day.

May 5th larva *C. parta* one inch long, dead-twig brown with a slightly lighter middorsal row of "sausage links." Head, true and prolegs, body color. Black dashes on the side of the head.

The first egg of *Catocala relicta* var *bianca* hatched May 5th.

It might be well to give a condensed description of the *ilia* larva. When full grown this caterpillar is from 2½ to 3 inches long, when at rest, and robust. Rather a light grayish in color with a tinge of green. Tubercles ashen. Over the 3d pair of prolegs is a darker cross band. True and prolegs gray. The lateral setae are short. Head rounded with narrow, dark brown dashes from the center above, half way to the mouth, outlining two large eyelike gray spots above with a small central lighter tubercle. The whole larva is quite light.

Eggs of *cara* and *relicta* began hatching on May 8th. On May 10th eggs of *amica* hatched and *concumbens* on the eleventh.

Eggs of *C. ultronia* collected by the junior author hatched on the 21st of April and the young larvae were rather elongate, brownish with a darker head. On the 30th, the larvae were one-half inch long and very slender, rather dark lead color with a lighter middorsal longitudinal streak and with a sharp distinct hump over the third pair of prolegs. On May 5th the caterpillars were three-fourths of an inch long, dark brown with a light middorsal narrow band or line. A red spine-like tubercle over the 3d pair of prolegs as in the larva of *C. paranympha* (European). Head lobed or tubercled above. True legs light in color. On May 11th, the larva one inch long lead-brown with a strong middorsal red tubercle over the third abdominal prolegs with a red cross band just behind

it. Head, true and prolegs, body color. Head somewhat *cara*-like with black lateral dash. Underside, pale lead color with distinct round black spots. A middorsal longitudinal lighter stripe. On May 15th all of the largest *ultronia* larvae died apparently in the last moult. The smaller ones stiffened in death and appeared life-like. They fed on wild plum and seemed to be like the larvae of *C. paranympha* in almost every respect, even habits.

On May 15th the larvae of *C. parta* were two and one fourth inches long, light grayish grown, striped longitudinally with a middorsal row of elliptical gray spots, disconnected. Head of the *cara* type with a broad black, lateral dash from the mouth around to the mouth. The upper lobes of the head yellow brown. The cross elliptical hump over the third pair of abdominal prolegs, light yellow brown inside a narrow, black encircling line. True and prolegs light gray-brown. Lateral row of very short setae.

The larvae of *unijuga* began spinning May 11th, those of *innubens* on the 19th and *parta* on the 21st.

The *innubens* larvae of this year were from eggs laid by a female *scintillans* and like the brood of last year were perfectly healthy and grew fast but when crowded, they do not reach the size of larvae in the woods.

As the eggs of *C. amica* are small, so are the larvae, light yellow brown in color with a big round, light chestnut head. The few specimens that the senior author had, refused both white and bur oak leaves and died without eating.

On the 23d of May, the larvae of *C. parta* were two and three fourths inches long, wood brown, striped longitudinally by lighter and darker bands, the striping more or less distinct. The hump over the third pair of prolegs hardly lighter than the dirty middorsal longitudinal band and not very conspicuous. The cross ridge over the eighth abdominal segment distinct but not abnormal. The spiracular and the two (one on either side) bands, flanking the middorsal band, darker than the other bands. Head small, flat, obcordate, with lobes

not otherwise colored than the light brown head. Lateral black dashes on the head very distinct. True and prolegs light. Lateral row of short setae. These larvae hide under paper in the bottom of the jar in day time, except on rainy or cloudy days when they remain on the twigs of their food plant. It is thus probable that one would have more success larvae hunting on rainy or cloudy days.

The first larva of *C. neogama* taken in 1910 was trapped between shingles leaning against a small walnut tree and, since the larva was past the second moult, it must have been seven or eight days old. Later, many other larvae of *neogama* were taken and proved quite healthy, contrary to last year's experience. The first imagoes of *C. illecta* emerged from bred pupae on the 26th of May. The larvae of these chrysalids began spinning on the 15th of April. Allowing five days from this date for the change to the pupa state, the length of the life of the chrysalis is over a month. Many of the later species of *Catocala* require less time to complete the pupal period.

*Illecta* is thus one of our earliest Catocalans, plentiful here but rarely seen. In fact the senior author has never seen one in day light, though Mr. Dodge reported starting them out of thistles as he walked through a clearing near the woods. It is probable that the much rarer *clintoni* is quite as early as *illecta*.

When sugaring on the night of the 29th of June, 1906, we took fresh specimens of *grynea, polygama, ultronia,* the one *parta* and one *consors*. The Illectas and *clintoni* taken were ragged and faded. *Ilia* is hardly later than *illecta* and *clintoni* and then comes *innubens*.

*Insolabilis* is another of the early moths, probably occurring in June though a St. Louis collector reports taking one specimen late in May.

June 6, 1910 a full grown larva of *C. ultronia* taken between shingles leaning against a "wild-goose plum tree," was two and one fourth Inches long, dark brown, exact color of plum bark. Tubercles distinct with brown tips. Middorsal band hardly

distinguishable. Head small, flat, cara-like with a black encircling line. Upper lobes of head yellow-brown. Between the 5th and 6th abdominal segments a cross band of light reddish-brown is back of a middorsal spine-like tubercle over the 5th segment in place of the wart of other *Catocala* larvae. There is a lateral row of short setae. True and prolegs, body color. This larva is much like that of *C. paranympha* of Europe. The general body color is a peculiar dead-wood brown and recalls the prunescence on *Catocala* pupae. The underside of the body is a beautiful purple with the mid-ventral row of black spots.

A second *ultronia* larva, taken between shingles on the 8th of June was one and three eighths inches long, mouse color with a somewhat lighter face bounded by an intensely black encircling line of dashes united above. The upper lobes of the head were colored as the body. The fifth abdominal segment was lighter, subdorsally. Tubercles dark, almost black with brown tips. The cross band over the 5th and 6th abdominal segments hardly distinguishable from the rest of the body but with a slight orange or red shade. The middorsal tubercle over the 5th abdominal segment, brown with a reddish tinge, long and spine-like. A strong black line behind the pair of tubercles on the 8th abdominal segment.

On the 13th of June another larva of *ultronia* was taken between shingles.

The first of these three caterpillars began spinning on the 7th of June, and the imago emerged on the 3d of July, the second imago on the 8th of July and the third on the 10th of the same month. It appears that the length of the pupal stage is about twenty two days. Among the three imagoes, there was considerable diversity of color.

A larva of *Catocala amica,* found on bur oak by the junior author on June 8th was five eighths of an inch long, light-lead, almost silver color. True and prolegs white. Head slightly darker than the body color. Tubercles like small black dots. June 9th, this larva moulted. Was about five eighths of an

inch long, light lead color with a lighter middorsal longitudinal band. Over the 5th abdominal segment a slight black cross ridge. True and prolegs light. Underside of body whitish green with inky black spots located midventrally. Head, body color, rather large and white at the lobes above with a black spot in front of each white lunule. Tubercles black.

The larva moulted again on the 14th of June, one inch long, ashen gray with somewhat lighter tubercles. From the second abdominal segment on to the end of the body, except the 5th segment the color is lighter. The middorsal band is narrow and of the same color as the body from the 2d abdominal segment on. The cross band over the 5th abdominal segment narrow but dark brown. Tubercles dark brown set in black. The dorsal pair of 7th abdominal tubercles dark red-brown, prominent. Head gray with cream colored lunules at the lobes above. Head somewhat *cara*-like. On June 19th the larva was one and a half inches long, reddish gray with lateral row of short setae. The middorsal band narrow and hardly differing from the general body. Tubercles red. True and prolegs body color. Head large but flattened in front and with pale yellow lunules at the lobes above, inside of which is a red tubercle. Tubercular bristles noticeable. Over the 5th abdominal segment is a blackish cross ridge and over the 8th abdominal segment a strong pair of red tubercles.

June 25th the *amica* larva one and three fourths inches long, slender, light gray in color. Tubercles like flesh-colored points. Head flattened in front and lobed above with pale yellow lunules at the lobes. No facial dashes. Head as body in color. No hump over the 5th abdominal segment which is dark and quite pronounced. The pair of tubercles over the 8th abdominal segment red and much stronger than the others, reminding one of the tubercles similarly situated on the much larger larva of *C. cerogama*. There is a lateral fringe but the setae are short. The under side of the body, pale with a greenish tinge. The midventral black spots present. The true and prolegs body color. The larva began spinning June

the 16th of June and the third on June 21st. The second of these died without pupating. The imago from the larva that began spinning June 17th appeared July 7th. The pupal period is apparently about three weeks.

On the 9th of June a pupa of *grynea* was found buried in the rotten wood of the top railing of a fence near an apple tree and later a chrysalis was dug from a crack in the same railing and a number of empty pupal skins found in cocoons attached to the underside of the railing. As the cocoon making in both *ultronia* and *grynea* is the same, bits of chewed leaves and silk, it is probable that neither of these spin under leaves on the ground.

The remarkable likeness of the larvae of these two species and of the European plum feeder, *paranympha* certainly places these moths close together and shows how absurd is the grouping of the species of *Catocala* upon color alone. There is no question that the safest and sanest classification is upon the larva. In a large series of specimens of any one of the species will be found a considerable variation in the color band of the hind wing as well as in the depth of color of the forewing. What would our systematists do with a black hindwinged *palaeogama* or a bright yellow-banded hindwinged *cara* or *ilia*?

The senior author's experience with the larvae of *concumbens* in 1910 was not quite so disastrous as that in 1909 with the same species. The eggs hatched early and the larvae did fine till at or past the last moult and probably would have pupated with little loss had the fine, mild weather continued, but the torrid heat that set in just before their last moult destroyed a number of them. The first larva began spinning June 17th and seven in all pupated but only four of the chrysalids gave imagoes and two of these were indifferent specimens. The other two were large and fine. Hardly better results attended the rearing of *relicta*, few of the larvae reaching the chrysalis stage. Still the imagoes were larger than those reared in 1909.

18th, and the chrysalis gave the imago July 17th with a pupal period of about 16 days.

Of fifty one pupae of *Catocala illecta*, seventeen gave female imagoes, four moths with deformed wings, and thirty-four male moths or two males to every female.

The first larva of *Catocala grynea* was trapped between shingles leaning against an apple tree on the 11th of June. It was one and a half inches long, dark leaden brown, striped longitudinally with dark and light leaden brown. The middorsal longitudinal band narrow and much lighter than the other stripes. A row of short lateral fringe.

Head gray with an encircling lateral black stripe or dash. True and prolegs dark. The place of the *Catocala* hump over the 5th abdominal segment is a horn-like tubercle, directed sharply backward and colored like the middorsal band but a little darker. The under side of the body flesh color with the midventral row of black spots.

A second larva of *grynea* was found June 15th between shingles and was one and five eighths inches long, light grey all over with a tinge of flesh color. Row of dense short lateral setae. Longitudinal bands but moderately distinct. Head brownish red about the lobes above with orange lunules at the lobes. True legs body color. Prolegs darker. Middorsal band narrow and of elongate links somewhat lighter than the body color. The horn like tubercle over the 5th abdominal segment, short, stout and directed backward and a little darker than the rest of the body.

The third larva, full grown, was found on the 19th of June and in coloration like the first. A black line on the 3d thoracic and the 3d, 4th, and 5th abdominal segments bounds the middorsal band on either side. A lower (stigmatal) lateral black line is noticeable on the 1st, 2d, 3d, 6th, and 8th abdominal segments. Head *cara*-like with lateral black dash and flesh-colored lunules at the lobes above.

The first of these larvae began spinning June 17th, making its cocoon of silk and bits of chewed leaves. The second on

In late August Harold Davenport took two specimens of *C. nebulosa* but both were ragged. However, he secured sixteen eggs from the female.

On August 12th, a female *Catocala abbreviatella* was taken in the grass under an apple tree and, although crippled, laid fourteen eggs. This was the first moth of this species taken at Louisiana by the senior author although Mr. E. A. Dodge reports taking it at *Asclepias* blooms in 1900, 1901 and 1902 after sundown.

On July 30th, Harold Davenport took a fine male *C. junctura* on a shade tree in the city limits. On the 15th of August he captured a splendid *C. angusi* var *lucetta,* having taken on July 31st, a gigantic male *C. viduata.*

The senior author took a fine perfect female *viduata* on September 6th and a ragged female *C. ilia* with light yellow hing wings, on the 8th, that laid a few eggs, somewhat larger than the usual *ilia* egg and almost black against a lighter brown. Rubbed, as it was, this moth was somewhat puzzling and not till she laid the eggs was the collector positively able to determine her specific relations.

From eggs laid by a *C. innubens,* plain form, a brood of larvae was reared in 1909 that gave not a single *scintillans* moth while from eggs laid by a *scintillans,* a fine lot of imagoes of which 46 per cent. were *scintillans* were bred in 1910. As in 1909 there was practically no loss in these larvae and it is this hardy character of the *innubens* caterpillar that assures an abundance of the moths, every summer. From the latter part of June till the first of September, it is fairly common in the woods and during much of these two months passable cabinet specimens may be secured. The majority of the first specimens of the season are of the variety *hinda* and this is smaller than the normal form that hardly appears in numbers much before August. A splendid variation of *hinda* has a white or cream colored spot on the front wing and a purple reflection from the top of the primaries. *Scintillans* appears along with *hinda* and lingers until *innubens* proper disappears.

The larva of *concumbens* were rather sluggish and at no stage of their growth did any of them ever rest on the underside of the breeding jar lid but remained mostly on the twigs even when well grown.

The larvae of *neogama* always hide under paper in the bottom of the jar.

The caterpillars of *amatrix, cara,* and *relicta* often rest on the underside of the jar lid.

For two or more years, the senior author's experience with larvae of *Catocala neogama, piatrix* and *cara* was anything but satisfactory, however, in 1909, all did well and good series of the moths were secured. The first *piatrix* larvae were perfectly healthy but toward the last of the season there was a considerable loss. Contrary to the experience of 1909, the senior author was able to rear a fine lot of *amatrix* larvae and secure a magnificent series of beautiful moths, setting nineteen perfect specimens.

The dainty coloration of the front wings of some of the female *nuri* is marvelous. There is no one of the series entirely without all vestige of the oblique black band across the front wing and it does seem strange that the commoner form should be designated the variety in this species.

Imagoes from larvae bred in doors, appear from one to two weeks earlier than moths from forest feeding caterpillars and it was an easy task the past year to foretell what would likely be in abundance in the woods a week or more later and the senior author was not disappointed in his conjecture that *ilia* and *piatrix* would be abundant, for 1910 was preeminently the year of these two moths. Hardly less numerous was *cara,* and *innubens* is always plentiful.

*Epione, relicta, vidua, robinsoni* and *angusi* were rather scarce. *Neogama, palaeogama* and *habilis* were hardly more abundant.

Numbers of *amatrix* picked up about town would seem to show this species common but the senior author did not see a specimen of it in the woods. It is an abundant moth at Vinton, Iowa.

against small walnut trees, plum trees and apple trees. *Neogama* has been taken under loose paper beneath walnut bushes and between shingles. *Cara, amatrix* and others may be found on dead twigs, along vines that climb their food plants or under leaves lying against the trees on which they feed. Hunts for larvae should begin by the first of April, as the eggs of several of the earlier species hatch in March.

The shingle trap should be early set and many good things can be taken on fruit trees, especially plum and apple. It is probable that half a dozen species can be taken on these trees alone, *clintoni, abbreviatella, grynea, polygama, crataegi* and possibly *titania.*

The junior author has found the south east corner of a wood the best collecting ground for imagoes this summer, but it has been the experience of the senior author that the moths are a little eccentric sometimes and just when he has searched all the known haunts and is about disgusted with the search, they turn up in numbers in unexpected places. After much rain, they are low and often, on hot dry days, are high in the trees. On cool days, of course, they are less active and can be more easily taken as they lie sheltered beneath a great limb base or among the foliage of *Ampelopsis.*

The peculiar habits of some of the Catocalae make it difficult to take perfect specimens. *Epione* and *piatrix* fly low, even alighting on the ground. So also do *cara,* and *amatrix* but less often. The whereabouts of *illecta* and *abbreviatella* in the day time are more or less mysterious.

For intelligent assistance in the the preparation of this paper and careful scrutiny of the manuscript in the typing, the authors are indebted to Miss Margaret Haley of Louisiana, Missouri.

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DRS. W. BARNES and J. MCDUNNOUGH, of Decatur, Ill., who are at present engaged on a revision of the two Lepidopterous families Megathymidae and Cossidae, would be very pleased to receive material for identification and comparison. Specimens of *M. cofaqui* Stckr. are particularly desired, also *Hypopta* species from the Western States. The authors contemplate giving accurate figures of all North American species, and guarantee the utmost care in handling of specimens.

It is likely that the larvae of *innubens* like those of *piatrix* develop irregularly during much of the summer and new moths are constantly appearing.

Of the *Catocala* larvae of the common species, that of *neogama* is perhaps the largest, measuring over three and a half inches and stocky in proportion. The larva of *amatrix* often reaches three and three fourths inches but is rather slender. *Cara* three to three and a half. *Concumbens* two and three fourths to three inches. *Unijuga*, three to three and a half inches. *Ilia* about three inches but stout. The pupal period of *amatrix* is from twenty three to twenty eight days; of *piatrix*, from twenty two to twenty five days; of *neogama* about twenty-four days.

The last *Catocala* imago from a bred pupa was a *piatrix* that emerged September 9th, but moths of this species were seen at Louisiana as late as September 22d. A female *C. robinsoni* was taken Oct. 1st and lived in captivity till the 15th. It seems more than likely that the food of most *Catocala* moths is the juices of fruits. One of the authors has seen evening after evening, Piatrices feeding at grapes. Wherever there was a bruised berry or wormy fruit, the moth settled down for a repast. He even recognized the same individual moth for much of two weeks at a repast of grape juice. Homoptera came to the same food. The scarcity of fruit this year may have rendered the moth bolder than usual for the author could have taken several of them in his fingers. The moth lights on the leaves or bunches of grapes with its wings half spread and thrusts its proboscis into the bruised place on the fruit.

Quite as interesting as capturing the moths is the search for larvae. It is little trouble to collect larvae of *illecta* and *innubens* since they are so plentiful and the former makes little effort to hide itself at any time, lying out boldly on the twigs. Where shag-bark hickory is plentiful larvae of *residua, angusi, habilis* and *palaeogama* may be secured in numbers beneath the bark, more rarely *judith, vidua* and *epione*. *Piatrix, ultronia* and *grynea* may be taken between shingles, leaned in pairs

# A new Anthidium from New Jersey.

By J. C. CRAWFORD.

**Anthidium harbecki** n. sp.

*Female.*—Length, about 13 mm. Black, with sparse white pubescence; head and thorax closely, coarsely punctured, the punctures of the mesonotum separated only by thin walls, those on the supraclypeal area, above insertion of antennae and on the clypeus, except on upper margin, about as close; those back of the ocelli separated from each other by about a puncture width; first joint of labial palpi about as long as second; maxillary palpi three jointed; the following body markings lemon yellow—clypeus; a small triangular supraclypeal mark; sides of face as high as insertion of antennae, and above that a narrow line on inner orbits; dilated above and attaining the height of anterior ocellus; a small spot behind the eyes below summit; a small spot on tegulae anteriorly and one on the tubercles; two small spots on anterior margin of mesoscutum, from which run caudad, lines reaching backward about as far as a line connecting the anterior margins of the tegulae; lateral margings of the mesoscutum; edges of axillae; margin of scutellum, interrupted medially, a short vertical line on the mesopleurae, narrow subapical bands on segments 1-5 and two elongate spots on segment 6; the band on segment one and two narrowly interrupted medially; all the bands with the posterior margin almost straight, the front margin at extreme sides dilated anteriorly and on segments 1-4 the bands attenuated medially; propodeum and pleuræ closely punctured; wings dusky with broad apical margins more deeply infuscated; legs strongly swollen, the basal joint of all tarsi broad and flat; the hind tibiae broadening towards apices; anterior apices of all tarsi broad and flat; the hind tibiae broadening towards apices; spur on hind and middle tibiae very thick; femora black, with a broad reddish-testaceous stripe above and the apices of the same color; lower margins of front and middle femora with a lemon-yellow stripe; tibiae yellow, the under sides reddish; basal joint of all tarsi yellow, the apical joints reddish; claws with a small but distinct pulvillus; pubescence on inner side of hind tarsi fulvous; apical margins of segments 2-5 narrowly depressed; basal margins of segments 2-6 somewhat constricted; punctures of abdomen not so coarse as on thorax, becoming finer towards bases of segments, those on the disks separated from each other by about a puncture width; anal opening on segment 6 in the shape of a cupid's bow; ventral scapa almost white.

Four female specimens collected by Mr. H. S. Harbeck at Wenonah, New Jersey, Aug. 21, 1910.

Type Cat. No. 13,454 U. S. N. M.

One of the paratypes deposited in the collection of the American Entomological Society.

Two of the paratypes differ in having the band on segment 2 entire.

## Observations on Cicada pruinosa and a description of a new species.

By Wm. T. Davis.

In Entomological News for April, 1907, Prof. Smith and Mr. Grossbeck mention eight examples of *Cicada pruinosa* Say from southern New Jersey. Say says of the species that it is "found on the Missouri; it is also very common in Pennsylvania. . . ." In July 1909 Mr. Geo. P. Engelhardt collected a male *pruinosa* near Wilmington, N. C..

So far as I am aware nothing has been written of the song and habits of this species, and so during the last week in August, 1910, I visited Cape May Co., N. J., with the object of finding out something about the insect. I had not long to wait, for on the 26th, on the road leading westward from Cold Spring, I heard in a hedge of large cedars and other tangle a cicada's song quite new to me. Upon climbing up one of the cedars I was pleased to capture the first *pruinosa* that I had seen alive. There were several others in the hedge, but I could not catch them. Later I found that the species was quite general in the cedar woods, though occasional in the deciduous forest as well. I collected one and heard many in the cedar and pine woods near Fishing Creek, but they were more numerous in a grove of red cedars, hollies, persimmon, etc., standing near the shore between Higbee's Landing and the Town Bank. I saw those females at their place, all on the cedars, but I didn't catch any of them, though I collected many males. At times there would be four or five singing together, and then there would be a period of quiet, and one might pass that way and never suspect the presence of *Cicada pruinosa*. The song when heard at a considerable distance might be taken for that of a bird; there is only a loud *zape, zape, zape,* but upon a nearer approach the constant *zing* is heard, so that the song may be rendered as *z-zape, z-zape, z-zape,* that is to say there is continuous *zing* with the *zape* at pulsating intervals. The song commences with a low *zing* or *zzz,* and gradually breaks into an impetuous *z-zape*. Some-

times the male sways his abdomen up and down with each *zape*. Occasionally an individual will only *zzz*, and not get up enough energy to *zape*. I listened to several such. Altogether the song is quite unlike any other cicada song that I have heard and cannot be confused with that of any of the other New Jersey species.

I collected several specimens of *Cicada lyricen* and two of *Cicada linnei* in the vicinity of Cold Spring, Bennett and Fishing Creek, but strange to say I heard or saw nothing of *Cicada sayi*.

In August, 1909, Mr. George P. Engelhardt collected a cicada at Blowing Rock, N. C. which was new to me. In July, 1910, Mr. Leng and I secured a much broken specimen at Clayton, Ga., and still later I received from Mr. Brimley a male and female of the same species collected at Raleigh, N. C. I have also a single specimen from Staten Island, N. Y., collected some years ago, that may belong to this species. While the insect resembles *Cicada lyricen* De Geer there are some striking differences in color by which it may be readily identified, and Mr. John A. Grossbeck to whom I have shown my material thinks with me that it should be named. I take pleasure therefore in naming this species for Mr. George P. Engelhardt of the Brooklyn Museum, who gave me my type specimen, and who has been my companion on many pleasant rambles afield.

**Cicada engelhardti** n. sp.

Length: ♂ 32 mm., to tip of wings, 50 mm.; ♀ 30 mm., to tip of wings 50 mm.

Head black, sometimes with narrow, tawny stripe on front. Prothorax black, with small greenish fulvous central arrow-shaped spot, broadest behind. In *lyricen* this spot is broadest in front. Posterior and lateral borders of the pronotum black. Mesothorax nearly all black, with two faint parenthesis-like lines of fulvous partly enclosing the central portion. Sometimes these lines are heavier and there is a shade of fulvous on the posterior portion of the mesothorax. The inner surface of the front marginal vein is usually back and darker than the same parts in *lyricen*. Abdomen black above, with two narrow pruinose lines or spots at base. Beneath, with broad central black stripe and at each side is a broad lateral pruinose border.

This insect is blacker than *Cicada lyricen*, lacking the considerable amount of fulvous markings of that species, particularly on the prothorax.

## Mallophaga from Birds and Mammals.

By V. L. KELLOGG and J. H. PAINE, Stanford University, California.

The following determinations, with description of one highly interesting new species, of *Mallophaga* are based on a small collection of these parasitic insects taken from various birds and one mammal, by Mr. Allen H. Jennings in the Panama Canal Zone. The specimens were sent us by Dr. S. T. Darling, Chief of Laboratory in Ancon Hospital, Ancon, Canal Zone, Isthmus of Panama.

**Lipeurus baculus** Nitzsch.

Specimen from the domestic pigeon (Canal Zone, Panama).

**Lipeurus assessor** Giebel.

Specimens from the turkey buzzard, *Cathartes aura,* (Canal Zone, Panama). Kellogg has recently recorded (Science, N. S. V. 31, pp. 783-784, 1910) this well-marked *Lipeurus* from the Californian condor, *Gymnogyps californianus,* and Carriker has taken it from the king vulture *Gypagus papa* in Costa Rica, while Giebel described it originally from the South American condor, *Sarcorhamphus gryphus.* It is thus a characteristic parasite of the greater American vultures. Osborn found a *Lipeurus* on turkey buzzards, *Cathartes aura,* at Ames, Iowa, but described it as a new species, *marginalis* (Ohio Naturalist, v. 2, p. 176, 1902). Specimens from the Canal Zone buzzards cannot, however, possibly be assigned to Osborn's species despite their agreement with it, and disagreement with typical *assessor,* in the matter of size. The characteristic strong medium and transverse abdominal markings of *assessor* (absent in *marginalis*) are plainly in evidence. If Osborn were a less careful systematist or less acquainted with the *Mallophaga,* we might suspect the two female specimens on which he established *marginalis* of being immature *assessors.* But as a matter of fact Osborn is both careful and well acquainted with the *Mallophaga* while, in addition, his description of the markings, confined to the lateral margins, indicates maturity of the specimens.

The small size of our specimens of *assessor* from the turkey buzzard, only two-thirds the ordinary *assessor* dimensions, should be noted perhaps by a varietal name, as *minor*.

**Lipeurus heterographus** Nitzsch.

Specimens from the domestic chicken (Canal Zone, Panama).

**Lipeurus variabilis** Nitzsch.

Specimens from the domestic chicken (Canal Zone, Panama). They seem to be Piaget's variety *gamma* recorded by him from certain pheasants, but if we should undertake in seriousness to subdivide this very variable species, *variabilis*, into its varieties, it would lead to senseless pages of variation describing.

**Goniocotes gigas** Taschenberg.

Specimens from domestic chicken (Canal Zone, Panama).

**Laemobothrium delogramma** Carriker.

One male and two females from the turkey buzzard, *Cathartes aura* (Canal Zone, Panama). The three specimens are larger than Carriker's measurements for the species. The male is 9 mm. long and the females 10 mm. each. The male is also considerably darker and more nearly wholly covered by markings than Carriker's description calls for. But on the whole if *delogramma* is a good species, and it seems to be our specimens should be assigned to it. It is a species certainly not far removed from Kellogg's *L. gypsis* from a griffon vulture, *Gyps kolbi*, from the Eastern Transvaal.

**Colpocephalum kelloggi** Osborn.

Specimens from the turkey buzzard, *Cathartes aura* (Canal Zone, Panama). The species was described from specimens taken on the same host in Iowa and Nebraska.

**Colpocephalum longicaudum** Nitzsch.

Specimen from a "fly catcher" (Canal Zone, Panama).

**Menopon alternatum** Osborn.

Specimens from the turkey buzzard, *Cathartes aura*, (Canal Zone, Panama). The species was described from specimens from the same host from Iowa and Nebraska.

**Menopon pallidum** Nitzsch.

Specimen from the domestic chicken (Canal Zone, Panama).

**Menopon incertum** Kellogg.

Specimen from a "fly catcher" (Canal Zone, Panama). Kellogg has recorded the species from several passerine birds from California and from twenty different bird species, mostly passerine, from the Galapagos Islands.

**Menopon jenningsi** n. sp. (Fig. I.)

Specimens, male and females, from a guinea pig, *Cavia cobaya,* (Canal Zone, Panama). This is the third *Menopon* species to be recorded from a mammal. *Menopon* is a two-clawed genus and ought to be found only on birds. As a matter of fact all but three of its more than two hundred species are limited to birds. The other two besides this present new one recorded from mammals are Piaget's *extraneum* and *longitarsus.* Of these two the first was described by its discoverer from the guinea pig and the second from *Halmaturus giganteus,* a large kangaroo. Curiously our new species, also from the guinea pig, does not at all resemble Piaget's *extraneum* from the same host, which is indeed quite of the usual bird-infesting Menopon type. But our species does show points of resemblance with the odd, aberrant species *longitarsus* from the kangaroo. Both *longitarsus* and our species have a curious superficial likeness to species of the typical guinea pig-infesting, one-clawed *Mallophaga* of the genus *Gyropus.* There seems to be an actual modification of these *Menopon* species of aberrant host habits toward the *Gyropus* species typical of the same hosts. Yet one of the mammal-infesting *Menopon* species is not at all modified in this way. Is its adoption of a mammal host a more recent matter, perhaps?

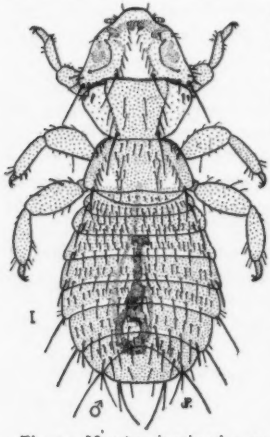


Fig. 1.—*Menopon jenningsi* n. sp.

*Description of male.*—Length, 1.6 mm.; width, .64 mm. across abdomen; general color pale, with light yellow on thorax and abdomen. Head: Length, .3 mm.; width, .48 mm.; front rounded; sides concave opposite the mandibles, then expanding before the antennae; remainder of margin slightly concave; posterior angles narrowly rounded. There are several minute hairs on the front; five short spines around the posterior angles, one of which, on the posterior margin, is very heavy; also one long spine on the posterior angle; a row of short spines on the dorsal surface extending from the mandibles along the faint occipital bands to the posterior margin with the marginal spine of this series long and heavy; occiput slightly sinuous.

*Thorax.*—Length, .44 mm.; width, .24 mm.; pro- and metathorax similar, the metathorax resembling the prothorax inverted; prothorax slightly longer and slightly narrower than the metathorax. Four short, stout spines at the anterior angle of the prothorax; two narrow longitudinal chitinous bands parallel to the margin on the prothorax with a long heavy spine arising at the posterior termination of each band. Two long heavy spines occur in the same relative position on the metathorax. Other spines as shown in the figure. There are numerous heavy spines on the ventral surface of both head and thorax. Legs pale in color.

*Abdomen.*—Length, .8 mm.; width, .6 mm., oval. An indistinct yellowish band and two rows of spines on each segment except the last; a heavy, long spine on each posterior lateral angle, except the last three, where two occur; length and strength of spines increasing posteriorly, those of the last segments being very heavy and long. Genitalia dark and conspicuous, extending almost to the thorax, and of unusual type.

*Female.*—Length, 1.72 mm.; width across abdomen, .68 mm. A fringe of fine hairs occurs on each side of the ventral surface of the last segment of the abdomen; this segment is rounded.

**Gyropus ovalis** Giebel.

Specimen from a guinea pig, *Cavia cobaya,* (Canal Zone, Panama).

**Trichodectes** sp.

A single poor specimen from a rat, *Mus rattus* (Canal Zone, Panama). Also two specimens of a wingless Psocid (Atropidae) were sent with the lot labelled "parasites from *Mus rattus.*" It would be very interesting if we could know that these Atropids were really living on the rats feeding on the hair or dermal scales. Kellogg has found Atropids in rats'

nests and bird nests living undoubtedly on the loose hairs, feathers and dermal exuviae. It is his belief, based primarily on certain striking facts of morphology, that the *Mallophaga* are degenerate descendants of the Psocidae (see Psyche, v. 9, pp. 339 ff., 1902).

## New North American Cossidae.

By Wm. Barnes, S.B., M.D., and J. McDunnough, Ph.D.

In anticipation of a revision of North American Cossidae, on which we are at present engaged, and in which we propose to figure all the species, we append descriptions of several new species which have recently been received by us. The types of all these are contained in Dr. Barnes' Collection.

**Givira minuta,** n. sp.

♂.—Front, white; antennae, slightly bipectinate, shaft white. pectinations brown; thorax gray, sprinkled with black, patagia and metathoracic tuft reddish-brown; abdomen smoky gray, with small black lateral tufts on third segment and prominent reddish-brown anal tuft; primaries light ochreous-brown, shaded with fuscous beyond cell, and with a broad creamy costal margin; on costa at base of wing is an indistinct smoky brown spot, followed outwardly by a large semi-triangular spot of same color, extending from costa to second anal vein, the apex situated at a point just below median vein, costal angle sharp, lower angle rather blunt and preceded by slight reddish scaling; a row of brown spots along costa of which those situated near apex are largest; a smoky brown patch in cell and a somewhat larger one situated between the base of second cubital and the second anal vein; on inner margin directly below this patch a minute circular patch of similar color, portion between this and base of wings containing several fine transverse striations; beyond these two patches a distinct whitish shade extending nearly to anal angle; an oblong reddish bar at end of cell, defined slightly by lighter; subterminal space from costa to vein Cu. with a series of large irregular smoky brown blotches, that between veins M1 and M2 being the smallest and followed by a white patch extending to margin of wing; some indistinct terminal black scaling, followed by a fine terminal line of a light ochre color; fringes checkered brown and white with dark basal line; secondaries dark smoky brown, lighter on costa, with very faint traces of scattered striations and a light ochre terminal line; fringes checkered, with dark basal line. Beneath dark smoky brown with an ochreous terminal line to both wings and the markings of upper side

faintly reproduced; costa of primaries lighter, with a series of dark dots; fringes as above. Expanse, 17 mm.

*Habitat*: Cochise Co., Ariz. (June 8-15) 1 ♂.

This species presents a great superficial resemblance to *Eugiva carisca* Schaus, from Jalapa, Mex. Through the kindness of Dr. Dyar we have received a water color drawing of this latter species, and a careful comparison has proved it distinct. It may be most easily separated by the white teminal patch, the larger size of the patch below cubitus, and the much darker color of the secondaries.

**Givira marga,** n. sp.

♂.—Antennae pectinate, brownish, with white scales on shaft; front grayish white; thorax and patagia brownish gray, thickly sprinkled with white, abdomen darker. Primaries gray, with an indistinct darker shade beyond the cell, extending to inner margin; covered with fine black strigae, especially noticeable in outer third, where they form several irregular bands across the wing; basal portion of wing free from markings except along costa which is dotted with black; a prominent white bar at end of cell; extremity of veins spotted with black. Secondaries smoky brown, lighter along costa with faint traces of reticulation and a dotted marginal line. Beneath primaries as above, lighter along inner margin, markings more indistinct; secondaries lighter, reticulation in outer half prominent; basal half of costa marked with black dashes. Expanse, 30 mm.

*Habitat*:—Santa Catalina Islands, Calif. Described from 2 ♂ ♂.

This species resembles *G. anna* Dyar, from which it may be distinguished by its darker ground color and the lack of white on basal half of inner margin of primaries.

**Givira lotta,** n. sp.

♂.—Antennae pectinate, brownish, with white shaft; front and palpi grayish; thorax and patagia smoky brown, strongly sprinkled with gray; abdomen with traces of tufts on basal segments, dark brown; primaries, ground color gray, obscured with dark brown at base, the dark shading extending obliquely to a point on costa beyond cell; costa gray, spotted with black; a faint white dot at apex of cell, and a white marginal line on basal half of inner margin; outer third of wing pure gray; faint traces of reticulation over whole wing; the extremity of veins bordered by a double row of black dots, which extend outward across the fringes; these latter gray, bordered outwardly slightly with white. Secondaries dark smoky brown with

traces of reticulation and darker checkering on fringes, which show traces of white at anal angle. Beneath, primaries, smoky, silvery gray along inner margin; costa, gray with black spots; traces of strigae over whole wing; fringes as above; secondary, pale gray, lighter along costa, which is striped with black; some traces of reticulation give a powdery appearance to wing; fringes dark brown. Expanse, 29 mm.

The faint dot at end of cell, combined with the dark brown markings is sufficient to distinguish this species from *anna* Dyar, and it differs from *marga* B. & McD. in possessing the white line on basal half of inner margin.

*Habitat*:—Yavapai Co., Ariz. (Buchholz), Aug. 16-23. 2 ♂ ♂.

**Hypopta palmata** n. sp.

♂—Palpi porrect, extending beyond front, antennae strongly bipectinate, shaft white; collar and thorax largely white, sprinkled with black and gray scaling; abdomen light brown, rather thickly haired at base and with slight blackish anal tuft; primaries white, shaded strongly with dark smoky brown along inner margin, below the cell from base of Cu2 to anal angle, and beyond the cell along veins M1 and M2, the dark scales extending slightly upward towards apex; veins, especially the branches of median and cubitus, outlined in dark, the dark scaling broadening out at extremity of veins to form small triangular patches along outer margin, the intervening white patches presenting a fan-like appearance; costal margin and cell remain entirely white, as well as a long oval patch below the cell between the cubitus and first anal, and a sharply pointed shaft extending between the two anal veins to their point of junction; fringes dusky, composed of black and white hairs; secondaries light smoky brown; veins slightly darker; fringes whitish. Beneath gray, lighter at base with veins sharply outlined in darker. Expanse, 22-26 mm.

*Habitat*:—Gila Co., Ariz. 2 ♂ ♂.

Genus **HAMILCARA** n. gen. (Type *atra* n. spec.)

Palpi minute, upturned; thoracic vestiture scaly; antennæ of ♂ bipectinate in basal half only; frenulum well developed; primaries narrow with large areole, vein R1 from cell, R2 from areole, R4 and R5 stalked from a point with R3, M1 from just below areole, M2 and M3 from a point, Cu from angle of cell, 1st and 2nd anal not connected; secondaries with S. C. free, R and M1 almost parallel from base of wing to margin, with perpendicular discocellular bar, M2 and M3 from

angle of cell, Cu 1 from behind "cellula intrusa," which is present on both wings.

This genus is closest to the European genus *Phragmataecia* Newm., but an examination of the type (*arundinis*) showed several points of difference in the venation of primaries; in *arundinis* vein R1 is from areole, which is much broader than in *atra* and connected basally with the "cellula intrusa;" the abdomen is also produced for a far greater length beyond hind wings, and the thoracic vestiture is entirely hairy.

It also differs considerably in venation from *Zeuzera* (type *pyrina* L.), the most readily distinguished feature being the lack of the cross-bar on secondaries between subcostal and radius.

**H. atra** n. spec.

♂.—General color dark smoky gray; thorax sprinkled with lighter scales and with blackish markings on hinder portion; abdomen gray; primaries thickly covered with fine black striations, forming a series of irregular transverse lines across wings; in basal portion these are closer together, causing a darker appearance; a narrow black bar at end of cell; secondaries smoky, lighter at anal angle and inner margin; remainder of wing very finely reticulated with black. Beneath as above; all black markings obscure except along costa of primaries for two-thirds its length. Expanse, 35 mm.

Santa Catalina Mts., Ariz. 1 ♂, Coll. Barnes.

**Hamilcara gilensis** n. spec.

♂.—Thorax gray, mixed with black, especially on metathoracic segment; base of legs thickly covered with long gray hairs; abdomen with short silky gray squammation; primaries gray, shaded with light brown in basal portion of submedian fold and with numerous fine black transverse striae, which in the outer portion of wing tend to form irregular bands; from costal margin, at one-third from base, a black bar of variable width, inwardly oblique, extends across cell to cubital vein; a narrow black bar at end of cell extends upward to costa, both bars being parallel; fringes dusky, checkered with black; secondaries pure white, bordered by dusky fringes, along the margin of which a few faint reticulations are discernable. Beneath, primaries, smoky gray, lighter along costa and inner margin; a series of dark spots on costal margin; striations of upper side faintly reproduced in outer portion of wing; secondaries as above. Expanse, 34-40 mm.

*Habitat*:—Gila. Co., Ariz. 3 ♂ ♂.

## Some Australian Sawflies.

By S. A. ROHWER, Washington, D. C.

Through the kindness of Mr. R. E. Turner, while in London last year, I had the pleasure of studying many specimens of Australian Tenthredinoidea belonging to him. The following species proved to be new. The Australian Tenthredinoid fauna is very different from any other region—the genus *Arge* being the only genus which is not restricted to the island and its immediate environs, excepting the introduced *Eriocampoides lamacina* (Retz.) Two species are described from the collections of the British Museum of Natural History, and all the types of all the species are in this Museum. Paratypes of some of the species collected by Mr. Turner are in the United States National Museum.

**Perga rubripes,** new species.

*Female.*—Length, 16 mm. Head, excepting the shining clypeus and posterior orbits, and thorax opaque, with fine, close punctures; antennal club nearly as long as the three preceding joints, rounded at the apex; lobes of the scutellum broad, obtuse, projecting posteriorly so as to form a nearly straight line with the sides of the scutellum; venation very like *bella* Newman. Black; head behind the supraorbital line, most of the posterior orbits, sides of the anterior lobe of mesonotum, and the scutellum dull rufous; middle of the clypeus, mandibles (apices piceous), legs below the coxae, and the two apical abdominal segments shining rufo-testaceous; antennae, a spot at the base of each antenna, margin of the clypeus, narrow posterior orbits, line on pronotum, tegulæ, lateral line on the side lobes of the mesonotum, line on the pleura, spot above the posterior coxa, and seven lateral spots on the abdomen white. Wings hyaline, iridescent; venation testaceous.

*Type locality*:—Tasmania. Two females.

*Type*:—In the British Museum of Natural History.

Related to *P. foeresteri* Westwood, but that species has the lobes of the scutellum extending laterally so as to form an angle with the sides of the scutellum.

**Perga leucomelas,** new species.

*Female.*—Length, 12.5 mm. Clypeus impunctate, slightly emarginate; head quadrate, dulled by small punctures; in front of the an-

terior ocellus is a shining, slightly depressed area; postocellar area defined laterally, with a longitudinal impressed line in the middle; eyes very prominent, almost circular in outline; malar space large; antennal club longer than any other joint, broadest in the middle; dorsulum and scutellum opaque, with fine punctures; lobes of the scutellum obtuse; sheath obliquely truncate. Head and thorax above brownish-ferruginous, with the pronotum a little paler; tergum except the sides and apex bright reddish-yellow; sides and apex of the tergum, pleuræ just beneath wings and the sheath dark brownish-black; venter, pectus, most of pleurae, legs except the infuscate middle tibiæ and tarsi the blackish posterior tibiæ and tarsi cream color; antennæ blackish, the apical two-thirds of the club pallid. Wings yellowish hyaline, iridescent; venation dark brown, stigma reddish.

*Type locality*:—Kuranda, Queensland, Australia; paratype from Cairns, Queensland. Collected by Mr. R. E. Turner.

*Type*:—British Museum of Natural History.

*Paratype*:—Cat. No. 13,357 U. S. N. M.

In color related to *P. cameroni* Westwood, but the second cubital cell is not longer than the first, and the pleuræ and venter are paler than the body.

**Perga froggatti,** new species.

*Female.*—Length, 14 mm. Clypeus and posterior orbits shining, with large, widely separated punctures; head and thorax opaque, with close, small punctures; club of the antennæ longer than the three preceding joints, the apex rounded; scutellum with two lateral lobes; second cubital cell quadrate; the third cubital cell as long as one and two combined; legs normal. Dark reddish brown; the tibiæ and abdomen a little paler. Wings yellowish hyaline, iridescent; venation the color of the body.

*Type locality*:—New South Wales, No. 222.

*Paratype locality*:—Cumberland, New South Wales.

*Type*:—In the British Museum of Natural History.

*Paratype*:—Cat. No. 13,358 U. S. N. M.

**Perga lucida,** new species.

*Female.*—Length, 14 mm. Head and thorax shining with large, sparse punctures, the punctures closer on the middle lobe of the mesonotum; scutellum flat, with very small apical lobes; mesonotum with the anterior lobe well defined; antennæ longer than the three preceding joints, rounded at the apex; second cubital cell not quadrate; third cubital cell much wider on the cubitus; legs normal. Shining

reddish-brown. Wings yellowish hyaline, iridescent; venation the color of the body.

*Type locality*:—New South Wales, No. 217.

*Type*:—In the British Museum of Natural History

This species and *P. froggatti* are related to *P. belinda* Kirby —the three being similarly colored and having six-jointed antennæ with the club longer than the preceding joints. They may be separated as follows:

Scutellum closely, densely punctured, opaque .... **froggatti Roh.**
Scutellum with scattered punctures, shining .....1
1. Occiput and vertex shining, with a few scattered punctures; middle lobe of the mesonotum well separated from the lateral ones .....**lucida** Roh.
Occiput and vertex with close punctures, opaque; anterior lobe of mesonotum poorly defined ..... **belinda Kby.**

Genus **PTERYGOPHORUS** Klug.

*Pterygophorinus* Ashmead.

*Lophyrotoma* Ashmead.

**Pterygophorus civetus** Klug.

*Pterygophorus insignis* Kirby.

**Pterygophorus uniformis** Kirby.

*Pterygophorus analis* Konow [1907, Zeit. Hym. Dipt., p. 218].

**Pterygophorus analis** A. Costa.

*Pterygophorus guadialis* Konow [1907, Zeit. Hym. Dipt., pp. 218, 219].

**Pterygophorus distinctus,** new species.

Easily recognized by the truncate clypeus, opaque appearance and pale spot on the pleuræ.

*Female.*—Length, 12 mm.; expanse, 25 mm. Clypeus very rough, the apex truncate; head, except a small area in front of the anterior outline, very opaque with close punctures; antennal furrows complete; postocellar area well defined; antennæ, 23-jointed (the apical joint wanting), the joints beneath with the normal triangular-shaped rami; dorsulum and scutellum opaque like the head, pleuræ more shining; abdomen opaque above; venation normal. Black; antennal joints 3-9, a spot on the pronotum, a large spot on the scutellum, metanotum, abdominal segments one and two, part of the sixth and the api-

cal segment yellow or slightly reddish; legs black; bases of the four anterior tibiae, their tarsi and the hind tibiae and tarsi the color of the body. Wings subhyaline, costa and basal vein at the apex very dark; venation dark brown, stigma and costa reddish.

*Type locality*:—Woodford, New South Wales. One female collected by Mr. G. A. Waterhouse, May 24, 1909.

*Type*:—British Museum of Natural History.

**Pterygophorus turneri,** new species.

Related to *P. distinctus* in the truncate clypeus, but may be distinguished from that species by the shining appearance, entirely black pleuræ, and the absence of antennal furrows below the ocelli.

*Female.*—Length, 12 mm.; expanse, 25.5 mm. Head very transverse, shining, impunctate; clypeus truncate; antennæ 20-jointed, the two apical joints almost consolidated; antennal furrows almost wanting below the ocelli; postocellar furrow gently curved; postocellar area well defined; thorax shining like the head; abdomen slightly dulled; venation normal. Shining blue-black; antennal joints 3-9, large spot on the pronotum, scutellum, metanotum, a faint indication of a narrow band on segments one and five, and the apical segment *straw-yellow,* legs black, base of the four anterior tibiæ, the hind tibiæ and tarsi straw-yellow. Wings yellowish hyaline, iridescent, costal area darker; venation pale brown, stigma and costa reddish.

*Type locality*:—Cairns, Queensland, Australia. Two females collected by Mr. R. E. Turner, for whom the species is named.

*Type*:—In the British Museum of Natural History.

*Paratype*:—Cat. No. 13,360 U. S. N. M.

**Pterygophorus zonalis,** new species.

Related to *P. interruptus* Klug, but that species has the transverse median vein but little basad of the middle of the first discordal cell, and the antennæ are entirely black.

*Female.*—Length, 10.5 mm.; expanse, 25.5 mm. Head quite transverse, shining; clypeus emarginate; antennal furrows wanting below the ocelli; postocellar area well defined; postocellar furrow rather sharply angled; thorax sculptured like the head, shining; venation normal; sheath rounded on the lower margin. Blue-black marked with reddish-yellow; antennal joints 3-9, large spot on the pronotum,

a spot on the pleuræ, scutellum, metanotum, abdominal segments one to four and the terminal segment reddish-yellow; apical abdominal segments velvety-black; the remainder of the body blue-black; legs black; all the tibiæ and tarsi reddish-yellow. Wings yellowish hyaline, iridescent, costal area from the basal vein to the apex of the wing much darker; venation black, costa and stigma reddish.

*Type locality*:—Mackay, Queensland, Australia. Two females collected by Mr. R. E. Turner, labeled "169 Hg."

*Type*:—In the British Museum of Natural History.

*Paratype*:—Cat. No. 13,359 U. S. N. M.

**EURYS** Newman.

The species of this genus may be separated by means of the following table:

Abdomen, pronotum and legs rufous; small species ..... **inconspicua** Kby.

Abdomen and thorax metallic ..... 1

1. Color, bright green ..... 2
   Color, dark olive green, or with a bronzy appearance..... 3
2. Clypeus deeply notched; malar space shorter than the pedicellum; base of the femora black ..... **nitidus** Kby.
   Clypeus nearly truncate; malar space about the same length as the pedicellum; femora entirely pale ..... **laetus** (Westw.)
3. With a strong reddish tint to the body; no ocellar basin, but a line-like furrow from the anterior ocellus to the middle fovea; (antennæ rather strongly clavate; scutellum rough, the edges sharp, slightly reflexed) ..... **aeratus** Newm.
   Without reddish tint; ocellar basin present and a broad shallow depression from the anterior ocellus to the middle fovea ..... **decepta** Roh.

**Eurys decepta,** new species.

*Female.*—Length, 5 mm. Clypeus deeply notched; malar space shorter than the length of the pedicellum; antennal and supraclypeal foveæ confluent; middle fovea very large and only slightly separated from the ocellar basin; ocellar basin broad; a fovea behind each lateral ocellus; antennæ rather clavate, the third joint longer than the fourth; head dullish, closely, finely punctured; dorsulum and scutellum shining; venation normal except the first cubital cell is narrow and as long as the second; claws simple. Head and thorax olive green, with a bronzy tint, metallic; the bronze color of the abdomen is more marked than that of the thorax; ventral part of tergal seg-

ments with pale spots; labrum, mandibles and legs below the trochanters rufous; wings slightly yellowish hyaline, iridescent; venation dark brown.

*Male.*—In general the male is like the female, but the base of the femora, or the femora entirely are black, and the pale spots on the abdomen are wanting.

*Type locality*:—Melbourne, Victoria, Australia. One female collected by French; and one female and four males labeled "C. F. 2' 01" No. 1,165 (supposedly from Victoria).

*Type*:—In the British Museum of Natural History.

*Paratype*:—Cat. No. 13,355 U. S. N. M.

**Euryopsis bella,** new species.

*Male.*—Length, 4.5 mm. Clypeus truncate; malar space shorter than the pedicellum; antennae 11-jointed, the third joint longer than the fourth; antennal furrows not very strong; ocellar basin wanting; middle fovea large, circular; head and thorax shining with separate punctures; venation as in *Eurys*. Bright metallic green; knees and legs below reddish. Wings yellowish hyaline, iridescent; venation brown.

*Female.*—What may be the female has the clypeus notched, and the legs reddish.

*Type locality*:—Near Sydney, Australia. Collected by Mr. R. E. Turner.

*Type*:—In the British Museum of Natural History.

Female in the U. S. National Museum.

The males of the two species of *Europsis* Kby. may be separated as follows:

Femora entire reddish; color blue with some greenish tints; apical antennal joint obtuse, shorter than the preceding **nitens** Kby.

Femora mostly black; color, green; apical antennal joint more acute and longer than the preceding ..... **bella** Roh.

**NEOEURYS,** new genus.

Short, robust, metallic species; clypeus truncate; malar space distinct; posterior orbits narrow; antennæ slender 14-jointed, the third joint longer than the fourth; scutellum rounded at the apex; body much like *Eurys*; claws simple; abdomen normal; the third cubital cell as long as the first and second combined; first recurrent vein received near the base

of the second cubital cell; the second recurrent vein received in the basal third of the third cubital cell; radial cell of the hind wings truncate and appendiculate. Venation in the main like *Eurys*.

Type of the genus:—*Neoeurys metallica* Rohwer.

Readily separated from its allies by the 14-jointed antennæ.

**Neoeurys metallica,** new species.

*Female.*—Length, 4.75 mm. Head opaque, finely and closely punctured; antennal furrows present near the ocelli only; postocellar furrow wanting; area between the lateral ocelli and the middle fovea raised; no ocellar depression; middle fovea oval more sharply defined above; antennal joints slightly ridged beneath; dorsulum and the scutellum more shining than the head; stigma broad, the lower margin rounded; sheath straight above, rounded below, the apex obliquely truncate. Metallic bronze; labrum, mandibles, four anterior knees, all the tibiæ and tarsi reddish-yellow. Wings yellowish hyaline, iridescent; venation pale brown, basal half of the stigma pallid.

*Type locality*:—Heborne, Victoria, Australia. Two females labeled "C. F. ♂ 00" No. 1,167.

*Type*:—In the British Museum of Natural History.

*Paratype*:—Cat. No. 13,356 U. S. N. M.

**DIPHAMORPHOS,** new genus.

Short, robust species. Head seen from the front broader than high, posterior orbits rather narrow, similar to some Nematines; clypeus short; labrum large; eyes slightly converging to clypeus; malar space present but narrow; antennæ inserted close to the clypeus, 15-jointed, third joint much longer than the fourth; ocelli in a triangle, the lateral ones on the supraorbital line; thorax much like *Blennocampa*; legs normal, postbasitarsis much shorter than the following joints, claws simple; venation differs from *Perreyia* as figured by MacGillivray [Proc. U. S. N. M. XXIX (1438) fig. 80] in the second recurrent being received by the third cubital cell.

Type of the genus:—*Diphamorphos nigrescens* Rohwer.

*Diphamorphos, Clarrisa* Kirby, *Eurys* Newman, *Europsis* Kirby and *Neoeurys* Rohwer will form a subfamily in the Tenthredinidæ. *Diphamorphos* may easily be separated from

the other members of the subfamily by the antennæ inserted close to the clypeus not near the middle of the face.

**Diphamorphos nigrescens,** new species.

*Female.*—Length, 6mm; robust; clypeus truncate; antennal furrows present and nearly complete; middle fovea deep, circular, with a transverse arm on each side; third antennal joint as long as four plus five; head and thorax shining, with some scattered punctures. Black; labrum, mandibles, legs below the knees and trochanters pallid; femora brown. Wings hyaline, iridescent; venation brown.

*Type locality*:—Victoria, Australia. Two females labeled "C. F. 2, 01" No. 1,187.

*Type*:—In the British Museum.

*Paratype*:—Cat. No. 13,353 U. S. N. M.

**Diphamorphos minor,** new species.

*Female.*—Length, 3.5 mm. Clypeus truncate; malar space very narrow; postocellar area well defined; antennal furrows wanting; ocellar basin wanting; posterior orbits very narrow; middle fovea deep, circular; third antennal joint as long as four plus five; head and thorax shining, without puncture; appendiculation of the radial cell not as distinct as in *nigrescens,* Black; legs below the coxæ and the four basal abdominal segments rufous. Wings hyaline, slightly dusky, iridescent; venation black.

*Male.*—Length, 3 mm. Postocellar area parted by a furrow; abdomen entirely black; otherwise as in female.

*Type locality*:—Cairns, Queensland, Australia. Many specimens collected by Mr. R. E. Turner. Specimens labeled "Kur. 2 '02."

*Type*:—In the British Museum.

*Paratype*:—Cat. No. 13,354 U. S. N. M.

A Preoccupied Generic Name.

**THYNNOTURNERIA** n. n.

*Turnerella* Roh., Ent. News, Vol. 21, Oct., 1910, p. 349; not *Turnerella* Ckll., Ent., Oct., 1910, p. 262.

*Type*:—*Thynnus cerceroides* Sm.

ERRATA.

Page 397.—Line 4 from bottom, for *endowed* read *colored.*

" 398.—Line 25, for *liquida* yet read *liquida* Grt.

" 400.—Line 25, for *external* read *antennal.*

—F. H. Wolley Dod.

# ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—EDS.

PHILADELPHIA, PA., DECEMBER, 1910.

We have lately received a letter from a distinguished entomologist who asks our help in getting his specimens determined. This is only one of a number of such letters we have received from various workers and collectors. He says, "I have been trying to find some kind person who will undertake to determine some Hymenoptera and another who would do the same in Diptera, but so far without success." He had applied to some museums and individuals without result and says, "So I am turning to you almost as my last hope." These conditions seem rather strange in view of the fact that the number of persons engaged in systematic work has greatly increased. The men at the various museums and experiment stations are all more or less systematists in part. We know naming things is not the easy task some persons think, but in the good old days it was not so difficult to get specimens named as there was always some hard working specialist and enthusiast who gladly did the work. There certainly seems to be something wrong in this respect at the present time. The plea of overwork seems like an excuse as the men in former times that did such work were not professional entomologists that worked from 9 to 4.30, but men engaged in other pursuits that worked at entomology after a hard day in earning their daily bread.

SAY WASP NESTS SET BARNS ON FIRE.—Hollidaysburg, Pa., Oct. 31.—Last week two of the largest barns in Blair County, owned by William McKillup and A. E. Helsel, worth $10,000, were burned to the ground. Investigators, after a thorough inquiry, put forth the theory that the barns were set on fire by wasps' nests, ignited by spontaneous combustion, produced by the chemical action caused by the wax coming in contact with the paper-like susbstance of which the nests are composed. —*Newspaper.*

# Notes and News.

## ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

THE ENTOMOLOGICAL SOCIETY OF AMERICA.—The fifth annual meeting of the Entomological Society of America, will be held in Minneapolis, Minn., Tuesday and Wednesday, December 27 and 28, 1910, in connection with the annual meeting of the American Association for the Advancement of Science. The annual address will be given on the evening of December 28th, by Prof. F. L. Washburn.

It is proposed to hold a joint session with the American Association of Economic Entomologists on the afternoon of December 28.—JOHN B. SMITH, *President;* C. R. CROSBY, *Secretary-Treasurer.*

UNIVERSITY OF PENNSYLVANIA ESTABLISHES NEW COURSE IN MEDICAL DEPARTMENT.—The study of beri-beri, sleeping sickness, leprosy, cholera, yellow fever and other distinctly tropical diseases will be one of the most important branches of scientific investigation to be undertaken in the new course of training for medical missionaries to be established this week at the medical department of the University of Pennsylvania.

The course, which has been made necessary by the opening of missions in tropical countries in all parts of the world, will facilitate the dealing with disease in those regions. It is intended not only to help the American who goes to the hot zones to carry a gospel of health and hygiene, but to prepare the student from Central and South America, who comes here to college, to meet home conditions. Heretofore no medical equipment to fit the physician for this peculiar phase of work has been given, and he reached his field of endeavor unable to cope with its diseases.

The lectures and clinics, which will last for fifteen weeks, although open to students of the medical department, will be in the nature of post-graduate work. Practicing physicians and graduates of other colleges will be admitted, and upon completion of the course they will be given a certificate.

The course will include the methods of preventing the spread of diseases and disinfection; the hygiene of houses, plantations, jails and immigrant stations. The various diseases of the eye, including the parasites of the eye and the stings of insects, will be discussed. In addition, there will be courses in surgery, bacteriology, pathology, helminthology, arthropodology, protozoology, tropical medicine and climatology, together with the study of the skin diseases of the tropics.

The lectures and clinics will be conducted by Drs. A. C. Abbott, W. Pepper, M. B. Hartzell, George E. de Schweinitz, G. P. Muller, Allen J. Smith and Philip P. Calvert and M. H. Jacobs.

THE EIGHTH INTERNATIONAL ZOOLOGICAL CONGRESS was held in Gratz, Austria, from the 15th to the 20th of August. Gratz is an important town, situated in the mountains and has an excellent university. There were nearly six hundred persons in attendance and over fifty delegates from the United States. Many important papers were read and the excursions and social functions were greatly enjoyed. The excursion to Dalmatia under the auspices of the Congress was a success in every way and the president Hofrat Prof. Dr. L. von Graff did everything in his power for the comfort and enjoyment of the excursionists.

The Austrian-Lloyd steamer Africa left Trieste on the morning of August the 20th and returned to the same place August 26th. Most of the towns in Dalmatia were visited. A numbers of congressionists also visited Bosnia and Herzegovina. Owing to the coronation of H. R. H. Prince Nicholas it was not possible to visit Cettinje, the capitol of Montenegro. Prof. Herbert Osborn of Columbus, Ohio, attended the Congress as representative of the Entomological Society of America and the Ohio State University. He read a paper on an entomological subject. Dr. Henry Skinner was also in attendance as representative of the American Entomological Society and the Entomological Society of America. The next Congress will be held in Monte Carlo, in 1913.

An Appeal To Reason.—A while ago the German Entomological National Museum in Berlin sent to me by mail a number of Hemiptera for determination. Upon the arrival of the package I was informed that I had to pay a duty of $7.13 as insects can be sent duty-free only to museums. The sum is not very large, but repeated several times a year it is not quite immaterial and this time I refused to pay it and ordered the package to be sent back to Berlin. Is there no entomologist in Washington of such social standing that he could make it clear to the very wise legislators who trot in the footsteps of Messrs. Payne and Aldrich that it is an outrage to have to pay a regular monetary penalty to the Government for the right to devote one's leisure hours to scientific studies? Is this one of those sacred points in the law which it would be "unconstitutional", or " un-American" to repeal? Or is there in this country a museum-trust trying to monopolize the study of foreign insects? Every time even small boxes with one or two types, sent by sample-post from abroad for comparison, are addressed to me, they must first go to the Customs in Boston where they sometimes are tampered with, apparently suspected to be something else than insects. Recently one of my correspondents had the happy idea to send some insects via Japan and San Francisco, and then for the first time I got them without trouble, though rather belated.

Yet difficult as it is to receive insects, it is hardly easier to send them abroad. When I sent my first box from Minnesota the postmaster, contrary to the regulations of the Universal Postal Union, refused to despatch it. As he had got his job from political reasons without knowing anything about postal matters (something unthinkable on the other side of the ocean), I realized that it was useless to argue with him and wrote to the Postmaster-General in Washingon whereupon I promptly got justice. Upon presentation of my first insect box at the postoffice in this city the postal official refused to forward it because the insects looked to him "poisonous" and "dangerous to handle." He did not yield until after a lengthy quibbling which has been more or less vigorously repeated every time I have had something to send.

Anywhere in Europe and its colonies, even in the remotest corner of darkest Russia, entomologists can send and receive insects without the slightest trouble, not to speak of duties. How long shall this remain a *pium desiderium* here?—E. Bergroth, Fitchburg, Mass.

THE twenty-third annual meeting of the American Association of Economic Entomologists will be held in Minneapolis, Minnesota, December 28 and 29, 1910, in connection with the annual meeting of the American Association for the Advancement of Science. The exact time and place of holding the sessions, information concerning hotel headquarters, railroad rates, etc., will be forwarded to members as soon as the program is made up.

The Association is assured a cordial welcome in Minneapolis and the members are urged to be present and assist in making the meeting a pronounced success.—E. D. SANDERSON, *President*, Morgantown, W. Va.; A. F. BURGESS, *Secretary*, Melrose Highlands, Mass.

RESEARCH WORK IN AFRICA.—The Entomological Research Committee (Tropical Africa), appointed by the Colonial Office, has lately issued Part 2 of the first volume of the *Bulletin of Entomological Research*. It contains articles by recognized experts on the subject, including Dr. J. B. Davey, Mr. Frank Hughes, Mr. Harold H. King, Mr. R. Newstead, Mr. F. C. Willcocks, Dr. A. C. Oudemans, and Mr. Charles Rothschild.

The *Bulletin* states that Mr. S. A. Neave, the committee's entomologist in East Africa, has recently visited the shores of the southern end of Lake Nyasa. He could find no signs of *Glossina palpalis*, and he considers that the nature of the vegetation and the general character of the insect fauna render it highly improbable that the species will be found there. *G. morsitans* was found abundantly on the Upper Shire river and on the western shores of Lake Nyasa, though in the latter case it was more plentiful half a mile or so inland than on the actual shore. This species appeared to be absent from the eastern side of the lake. Mr. Neave has also traversed the southern portion of the Protectorate, and is now proceeding by land along the whole western side of the lake, leaving Karonga about the middle of July and striking across German East Africa to Mombasa. On the west coast Mr. J. J. Simpson has already visited all the medical posts in the Western Province of Southern Nigeria, and most of those in the Central Province. He is now traversing the Eastern Province, and will then proceed to Northern Nigeria. Encouraging reports have been received from both entomologists with regard to the cooperation of medical and other officers in furthering the work of the committee.

It is also announced that arrangements have been made by the Colonial Office for short courses in entomology to be given at the two Schools of Tropical Medicine at Oxford, Cambridge, Edinburgh, and Dublin, for the benefit of officers in the African Colonies and Protectorates when home on leave. Advantage has already been taken of this in a number of cases, for during the present summer the following numbers have taken, or are taking, courses in entomology:—Officers from the Gold Coast, 7; from Sierra Leone, 2; from Northern Nigeria, 1; from Southern Nigeria, 8; from the East Africa Protectorate, 3; from Uganda, 1; from Nyasaland, 2; making a total of 24. Twenty-two other officers have intimated their desire to take the course in the near future.—*London Times.*

# Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology, unless treating of new genera, will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (°) following a record, denotes that the paper in question contains description of a new genus; while this (*), that of a new North American form.

For complete record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

**4**—The Canadian Entomologist. **5**—Psyche, Cambridge, Mass. **6**—Journal, New York Entomological Society. **7**—U. S. Department of Agriculture, Bureau of Entomology. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Comptes Rendus, L'Academie des Sciences, Paris. **16**—Bulletin, Societe Nationale d'Acclimation de France, Paris. **22**—Zoologischer Anzeiger, Leipzig. **35**—Annalen, Societe Entomologique de Belgique. **40**—Societas Entomologica, Zurich. **44**—Verhandlungen, K. k. zoologisch-botanischen Gesellschaft in Wien. **50**—Proceedings, U. S. National Museum. **53**—Transactions and Proceedings, New Zealand Institute, Wellington. **55**—Le Naturaliste, Paris. **76**—Journal, Cincinnati Society of Natural History. **83**—Notes from the Leyden Museum. **84**—Entomologische Rundschau. **89**—Zoologische Jahrbucher, Jena. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **94**—"Das Thierreich" herausgegeben von d. Deutschen zoologischen Gesellschaft, Berlin. **123**—Bulletin, Wisconsin Natural History Society, Milwaukee. **136**—Stettiner Entomologische Zeitung. **152**—California Agricultural Experiment Station, Berkeley. **153**—Bulletin, American Museum of Natural History, New York. **173**—Die Grossschmetterlinge der Erde, von A. Seitz, Stuttgart. **176**—Archiv fur entwicklungsmechanik der Organismen, Leipzig. **179**—Journal of Economic Entomology. **180**—Annals, Entomological Society of America. **188**—Bulletin, International Academie des Sciences de l'Empereur Francois Joseph I., Prague. **189**—Pomona Journal of Entomology, Claremont, Cala. **232**—Bulletin, Societe Portugaise des Sciences Naturelles, Lisbon. **262**—Public Health and Marine Hospital Service of the United States, Washington. **268**—Acta Societatis Scientiarum Fennicae, Helsingfors. **285**—Nature Study Review, Urbana, Illinois. **291**—Proceedings, Staten Island Associa-

tion of Arts and Sciences, Lancaster, Pa. **292**—Acta Universitatis Lundensis (nova series). **293**—Spolia Zeylanica, Colombo, Ceylon. **294**—Fauna Sudwest-Australiens. Ergebnisse der Hamburger sudwest-australischen Forschungsreise 1905. Jena. **295**—Handbuch der Vergleichenden Physiologie. Herausgegeben von Hans Winterstein. Jena. **296**—Forest and Stream, New York.

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**HEMIPTERA. Barber, T. C.**—The Coccidae of Audubon Park, New Orleans. (First Paper.) **179,** iii, 420-425. **Bergroth, E.**—

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graph of the Rhopalocerous genus Ornithoptera, Vol. II. Pub. by the author, Upper Norwood, S. E., England. **Schaus, W.**—New species of Heterocera from Costa Rica, II, **11,** vi, 402-422 (*). **Schmidt, H.**—Biologische Bemerkungen zu einigen gallenerzeugenden Schmetterlingen, **40,** xxv, 57-58. **Smith, J. B.**—Notes on certain Taeniocampa species, **4,** xlii, 317-323. Notes on the N. A. species of Agroperina, **6,** xviii, 137-148 (*). Notes on the species of Anytus, **5,** xvii, 206-209 (*). **Warren, W.**—Euchoristea gen. nov. Fauna palaearctica, **173,** Lief. 65, 93 (°).

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## Doings of Societies.

At a regular meeting of the Feldman Collecting Social held Sept. 21st, 1910, at 1523 S. 13th St., Philadelphia, thirteen members were present. Pres. Harbeck in the chair.

Dr. Castle read an itemized list of the families represented in the Coleoptera recently collected by him in Florida—in all about 300 species.

Mr. C. T. Greene exhibited a pair of *Sphecius speciosus* Dru. (Hym.) collected at Wenonah, N. J., IX-5-10.

Mr. Harbeck reported the finding of a colony of *Stelis australis Cress* (Hym.) at Wenonah, N. J., on VIII-28-10, taking about twenty specimens. Three specimens were also taken of a species of *Dianthidium* (Hym.) which he could not identify.

Mr. Laurent stated that *Polyphylla variolosa* Hentz (Col.) was very common around the electric lights at Anglesea, N. J., on the night of June 30th. Of thirty or more specimens collected all proved to be males; said that he had been with Dr. Skinner about twenty-six years ago when two were caught at Asbury Park, N. J. Dr. Castle remarked that Dr. Stevens had found this species plentiful at Plymouth, Mass. The females apparently never come out, but could be found by watching the males dig in the sand and then following them. Mr. Wenzel said this was questionable, as in *occidentalis* the female is the commoner. He mentioned a case where many females of *variolosa* were found on and near a rail fence.

Mr. Harbeck said in Trenton, while people were away from home from Saturday morning until Monday morning, the Catalpa sphinx larvae had completely denuded a Catalpa tree and that a bucket and a half of larvae had been collected from the remaining trees.

Mr. Haimbach exhibited five specimens of a moth collected at Hyde Park, Mass. VII-10-10 and stated that he had taken fifty-one in two days. It belongs to the genus *Periclymenobius* containing three species all described from the Pacific coast. The species shown is *P. frustellus* Wals. (on determination of Mr. Kearfott). Mentioned having seen the flight of the Brown-Tail Moth while there and said that if one looked at the electric lights it resembled a blizzard.

Adjourned to the annex.

GEORGE M. GREENE,
*Secretary.*

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# Entomological News

AND

# PROCEEDINGS

OF THE

## ENTOMOLOGICAL SECTION

OF THE

## Academy of Natural Sciences of Philadelphia.

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## VOLUME XXI, 1910.

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**Wanted** connections with reliable entomologists in California, Arizona and Florida for the intercourse of mutual assistance in experimental work with Heterocera and Rhopalocera.—Carlo Zeimet, 170 William Street, New York, P. O. Box 1613.

**Cicindelidae** for exchange. All are first class, fresh, in papers. Also have others in my collection.—Adolph Maresh, 2517 S. Homan Avenue, Chicago, Ill.

**Wanted**—Proc. Ent. Soc. Phila., Vol. ii; Trans Am. Ent. Soc., Vol. iii; Experiment Station Record, Vol. iii, No. 4, and Vol. iv, No. 5; Bull. of Brooklyn Ent. Soc., Vol. iii. Will pay cash or exchange.—R. W. Harned, Agricultural College, Mississippi.

**Wanted**—Riley's 9th Mo. Report. Have Riley's 4th and the Supplement to 9th and index to the 9th Mo. Reports for sale.—E. O. G. Kelly, Wellington, Kansas.

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**Coleoptera** exchanged for native or exotic specimens new to my collection List on application.—Emil Liljeblad, 1018 Roscoe St., Chicago, Ill.

**Wanted**—All kinds of pupae and cocoons either for cash or good exchange.—Herman H. Brehme, 74 13th Ave., Newark, N. J.

**Have for Exchange**—Eggs of *Catocala innubens, cara, ilia, neogama, vidua, piatrix, scintillans* and pupae of *modesta* and other hawks and pupae of *ajax, cresphontes, luna* and others. Wish eggs or imagoes of *marmorata*, etc.—R. R. Rowley, Louisiana, Mo.

**Imported Indian Cocoons** of *atlas, mylitta, roylei, ricini, trifenestrata, selene, leto* and others, and hybrid *selene-luna* in papers for *regalis, versicolora* and other live native pupæ.—James L. Mitchell, 212 Indiana Trust Building, Indianapolis, Indiana.

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**Lepidoptera**—I have for exchange living pupae of *Adelocephala bicolor, Sphinx jamaicensis;* also in papers, *Meganostoma coesonia, Apantesis virguncula* and *catocalae.*—James Tykal, 2807 Ridgeway Avenue, Chicago, Ill.


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